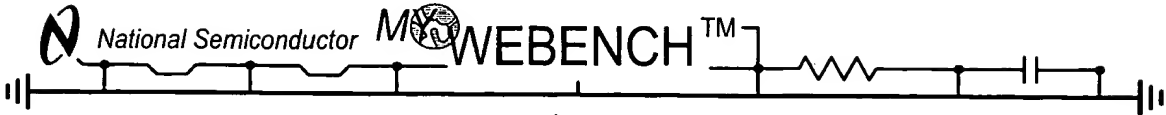


Fig. 1



My Webench

My Webench organizes your designs with secure password protected storage. Design details include your specifications, bill of material, schematic, simulations and on line ordering of parts and demo boards.

You currently have no stored designs.

Select one of the Design Assistants to start a New Design.

Webench Tools

Assistants Save Your Time!

Let our Design Assistants guide you through each step. You can choose from either the

- Power Supply Design Assistant

204

or

- Wireless EasyPLL Design Assistant

206

The assistant will walk you through each of the steps. You can choose when to stop as you can always return later to finish another step.

Visit these portals having Webench tools;

- POWER.NATIONAL.COM featuring WebSIM™
- WIRELESS.NATIONAL.COM featuring EasyPLL

Using Webench Tools

Four Easy Steps and You're Done!

1 Choose a Part

Input your system specifications and you will find those devices that fit.

2 Create a Design

A design will be created for you including any necessary passive components and important calculated operating values.

3 Analyze a Design

Use a variety of simulation tests to validate your design.

4 Build It!

Buy a part, kit of parts, evaluation board.

202

Fig. 2



Title: NETWORK-BASED INTEGRATED DEVICE IDENTIFICATION
AND ORDERING SYSTEM

Inventor(s): Wanda Carol Garrett, et al.

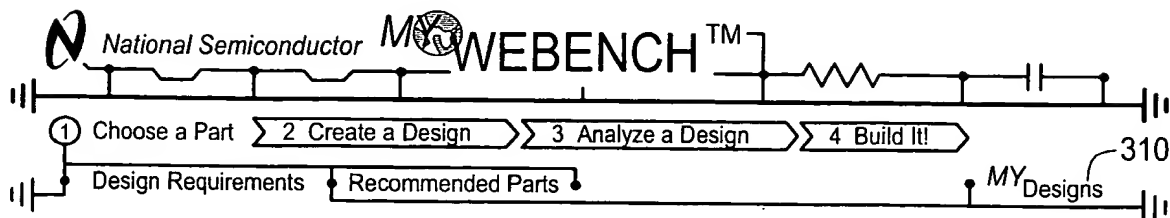
Serial No.: 09/707,325

Docket No. 12421-0030

REPLACEMENT SHEET

Sheet 3 of 19

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Enter your power supply design requirements.

Basic Selections

VIN MIN V
VIN MAX V } 302

Output Voltage
Output #1 V out V I out A } 304

Choose Additional features (Optional)

306 { ON/OFF PIN ☐ NO ☐ YES ☒ IGNORE
ERROR FLAG ☐ NO ☐ YES ☒ IGNORE
SYNC PIN ☐ NO ☐ YES ☒ IGNORE

OUTPUT 2 V out V I out A
OUTPUT 3 V out V I out A

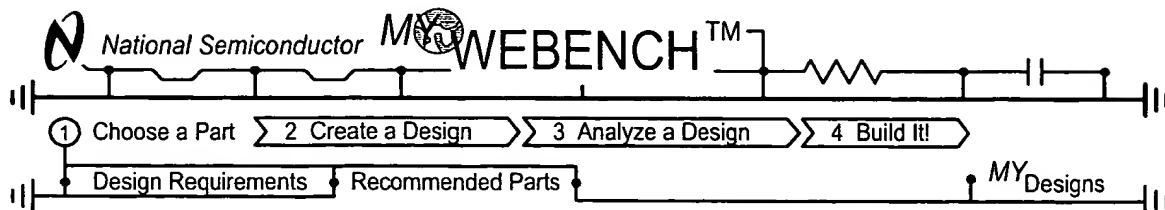
Show Recommended Power Management ICs

308

Fig. 3



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Your Design Specifications

VinMin:14.0V	Output #1
VinMax:22.0V	Vout= 3.3V
	Iout= 1.0A

Suggested Switching Regulators - Buck Topology

Product Folder	Webench Tools	Max Curr.	Typ. Eff.	On/ Off	Err. Pin	Other Features	Freq. kHz	Est. Price
<u>LM2575-3.3</u>	Create Design See CC Note below	1.0A	75%	Y	N		52	\$1.72
<u>LM2575-ADJ</u>	Create Design See CC Note below	1.0A	75%	Y	N	Adj. Vout	52	\$2.15
<u>LM2575HV-3.3</u>	Create Design See CC Note below	1.0A	75%	Y	N		52	\$2.15
<u>LM2575HV-ADJ</u>	Create Design See CC Note below	1.0A	75%	Y	N	Adj. Vout	52	\$2.15
<u>LM2576-3.3</u>	Create Design See CC Note below	3.0A	75%	Y	N		52	\$2.40
<u>LM2576-ADJ</u>	Create Design See CC Note below	3.0A	75%	Y	N	Adj. Vout	52	\$2.40
<u>LM2576HV-3.3</u>	Create Design See CC Note below	3.0A	75%	Y	N		52	\$2.98
<u>LM2576HV-ADJ</u>	Create Design See CC Note below	3.0A	75%	Y	N	Adj. Vout	52	\$2.98
<u>LM2595-3.3</u>	Create Design	1.0A	78%	Y	N		150	\$1.86
<u>LM2595-ADJ</u>	Create Design	1.0A	78%	Y	N	Adj. Vout	150	\$1.86
<u>LM2596-3.3</u>	Create Design	3.0A	73%	Y	N		150	\$2.61
<u>LM2596-ADJ</u>	Create Design	3.0A	73%	Y	N	Adj. Vout	150	\$2.61
<u>LM2598-3.3</u>	Create Design	1.0A	78%	Y	Y	SoftStart	150	\$2.18
<u>LM2598-ADJ</u>	Create Design	1.0A	78%	Y	Y	SoftStart, Adj. Vout	150	\$2.18
<u>LM2599-3.3</u>	Create Design	3.0A	73%	Y	Y	SoftStart	150	\$2.91
<u>LM2599-ADJ</u>	Create Design	3.0A	73%	Y	Y	SoftStart, Adj. Vout	150	\$2.91
<u>LM2630</u>	Create Design See CC Note below	8.0A	94%	Y	Y	Sync, SoftStart, Adj. Peak Current Limit	200	\$2.75
<u>LM2631</u>	Create Design See CC Note below	8.0A	94%	Y	Y	Sync, SoftStart, Adj. Peak Current Limit	200	\$2.75
<u>LM2670-3.3</u>	Create Design See CC Note below	3.0A	86%	Y	N	Sync, SoftStart	260	\$2.63

Fig. 4



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Design Purchasing Quality Company Jobs

Products > Analog - Regulators > Simple Switchers > LM2575

Product Folder

LM 2575 SIMPLE SWITCHER 1A Step-Down Voltage Regulator

See Also: LM2595 - low cost & more efficient

502 { LM2598 - upgrade
LM2672 - upgrade
LM2675 - upgrade

Generic P/N 2575

Contents

- General Description
- Features
- Applications
- Datasheet
- Package Availability, Models, Samples & Pricing
- Design Tools
- Application Notes

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Parametric Table	
Multiple Output Capability	No
On/Off Pin	Yes
Error Flag	No
Input Voltage, min (Volt)	4
Input Voltage, max (Volt)	40
Output Current, max	1 Amp
Output Voltage (Volt)	12,15,3.30,5,1.20
Adjustable Output Voltage	No, Yes
Switching Frequency (Hz)	52000
Adjustable Switching Frequency	No
Sync Pin	No
Efficiency (%)	88,75,77
Inverting	Yes
Step-down	Yes

Fig. 5A



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General Description

The LM2575 series of regulators are monolithic integrated circuits that provide all the active functions for a step-down (buck) switching regulator, capable of driving a 1A load with excellent line and load regulation. These devices are available in fixed output voltages of 3.3V, 5V, 12V, 15V, and an adjustable output version.

Requiring a minimum number of external components, these regulators are simple to use and include internal frequency compensation and a fixed-frequency oscillator.

The LM2575 series offers a high-efficiency replacement for popular three-terminal linear regulators. It substantially reduces the size of the heat sink, and in many cases no heat sink is required.

A standard series of inductors optimized for use with the LM2575 are available from several different manufacturers. This feature greatly simplifies the design of switch-mode power supplies.

Other features include a guaranteed $\pm 4\%$ tolerance on output voltage within specified input voltages and output load conditions, and $\pm 10\%$ on the oscillator frequency. External shutdown is included, featuring $50\mu\text{A}$ (typical) standby current. The output switch includes cycle-by-cycle current limiting, as well as thermal shutdown for full protection under fault conditions.

Fig. 5B

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Features

- 3.3V, 5V, 12V, 15V, and adjustable output versions
- Adjustable version output voltage range, 1.23V to 37V (57V for HV version) $\pm 4\%$ max over line and load conditions
- Guaranteed 1A output current
- Wide input voltage range, 40V up to 60V for HV version
- Requires only 4 external components
- 52 kHz fixed frequency internal oscillator
- TTL shutdown capability, low power standby mode
- High efficiency
- Uses readily available standard inductors
- Thermal shutdown and current limit protection
- P⁺ Product Enhancement tested

Applications

- Simple high-efficiency step-down (buck) regulator
- Efficient pre-regulator for linear regulators
- On-card switching regulators
- Positive to negative converter (Buck-Boost)

Datasheet



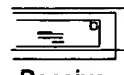
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LM1575/LM2575/LM2575HV Series SIMPLE SWITCHER 1A Step-Down Voltage Regulator	609 Kbytes	1-Jun - 99	View Online	Download	Receive via Email
LM1575/LM2575/LM2575HV Series SIMPLE SWITCHER 1A Step-Down Voltage Regulator (JAPANESE)	894 Kbytes				

Fig. 56

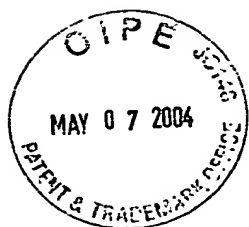


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Package Availability, Models, Samples & Pricing

Part Number	Package		Status	Models		Samples & Electronic Orders	Budgetary Pricing		Std Pack Size	Package Marking
	Type	# pins		SPICE	IBIS		Quantity	\$US each		
LM2575M-12	SOIC WIDE	24	Full production	N/A	N/A	Samples	1K+	\$1.7200	tube of 30	[logo]U ϕ Z ϕ 2 ϕ T LM2575M -12 P+
LM2575M-15	SOIC WIDE	24	Full production	N/A	N/A	Samples	1K+	\$1.7200	tube of 30	[logo]U ϕ Z ϕ 2 ϕ T LM2575M -15 P+
LM2575M-3.3	SOIC WIDE	24	Full production	N/A	N/A	Samples Order Parts	1K+	\$1.7200	tube of 30	[logo]U ϕ Z ϕ 2 ϕ T LM2575M -3.3 P+
LM2575M-5.0	SOIC WIDE	24	Full production	N/A	N/A	Samples Order Parts	1K+	\$1.7200	tube of 30	[logo]U ϕ Z ϕ 2 ϕ T LM2575M -5.0 P+
LM2575M-ADJ	SOIC WIDE	24	Full production	N/A	N/A	Samples Order Parts	1K+	\$1.7200	tube of 30	[logo]U ϕ Z ϕ 2 ϕ T LM2575M -ADJ P+
LM2575MX-12	SOIC WIDE	24	Full production	N/A	N/A	Order Parts	1K+	\$1.7500	reel of 1000	[logo]U ϕ Z ϕ 2 ϕ T LM2575M -12 P+
LM2575MX-15	SOIC WIDE	24	Full production	N/A	N/A	.	1K+	\$1.7500	reel of 1000	[logo]U ϕ Z ϕ 2 ϕ T LM2575M -15 P+
LM2575MX-3.3	SOIC WIDE	24	Full production	N/A	N/A	.	1K+	\$1.7500	reel of 1000	[logo]U ϕ Z ϕ 2 ϕ T LM2575M -3.3 P+
LM2575MX-5.0	SOIC WIDE	24	Full production	N/A	N/A	Order Parts	1K+	\$1.7500	reel of 1000	[logo]U ϕ Z ϕ 2 ϕ T LM2575M -5.0 P+
LM2575MX-ADJ	SOIC WIDE	24	Full production	N/A	N/A	Order Parts	1K+	\$1.7500	reel of 1000	[logo]U ϕ Z ϕ 2 ϕ T LM2575M -ADJ P+
LM 2575N-12	MDIP	16	Full production	N/A	N/A	Samples	1K+	\$1.7200	tube of	[logo]U ϕ Z ϕ 3 ϕ T ϕ P LM2575N

Fig. 5D



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LM2575N - 12	<u>MDIP</u>	16	Full production	N/A	N/A	Samples Order Parts	1K+	\$1.7200	tube of 20	[logo]U ₀ Z ₀ 3 ₀ T ₀ P LM2575N - 12 P+
LM2575N - 15	<u>MDIP</u>	16	Full production	N/A	N/A	Samples Order Parts	1K+	\$1.7200	tube of 20	[logo]U ₀ Z ₀ 3 ₀ T ₀ P LM2575N - 15 P+
LM2575N - 5.0	<u>MDIP</u>	16	Full production	N/A	N/A	Samples Order Parts	1K+	\$1.7200	tube of 20	[logo]U ₀ Z ₀ 3 ₀ T ₀ P LM2575N - 5.0 P+
LM2575N - ADJ	<u>MDIP</u>	16	Full production	N/A	N/A	Samples Order Parts	1K+	\$1.7200	tube of 20	[logo]U ₀ Z ₀ 3 ₀ T ₀ P LM2575N - ADJ P+
LM2575T - 12	<u>TO - 220</u>	5	Full production	N/A	N/A	Samples Order Parts	1K+	\$1.4300	tube of 45	[logo]U ₀ Z ₀ 2 ₀ T ₀ LM2575T - 12 P+
LM2575T - 15	<u>TO - 220</u>	5	Full production	N/A	N/A	Samples Order Parts	1K+	\$1.4300	tube of 45	[logo]U ₀ Z ₀ 2 ₀ T ₀ LM2575T - 15 P+
LM2575T - 3.3	<u>TO - 220</u>	5	Full production	N/A	N/A	Samples Order Parts	1K+	\$1.4300	tube of 45	[logo]U ₀ Z ₀ 2 ₀ T ₀ LM2575T - 3.3 P+
LM2575T - 5.0	<u>TO - 220</u>	5	Full production	N/A	N/A	Samples Order Parts	1K+	\$1.4300	tube of 45	[logo]U ₀ Z ₀ 2 ₀ T ₀ LM2575T - 5.0 P+
LM2575T - ADJ	<u>TO - 220</u>	5	Full production	N/A	N/A	Samples Order Parts	1K+	\$1.4300	tube of 45	[logo]U ₀ Z ₀ 2 ₀ T ₀ LM2575T - ADJ P+
LM2575S - 12	<u>TO 263</u>	5	Full production	N/A	N/A	Samples Order Parts	1K+	\$1.4300	tube of 45	[logo]U ₀ Z ₀ 2 ₀ T ₀ LM2575S - 12 P+
LM2575S - 15	<u>TO 263</u>	5	Full production	N/A	N/A	Samples Order Parts	1K+	\$1.4300	tube of 45	[logo]U ₀ Z ₀ 2 ₀ T ₀ LM2575S - 15 P+
LM2575S - 3.3	<u>TO 263</u>	5	Full production	N/A	N/A	Samples Order Parts	1K+	\$1.4300	tube of 45	[logo]U ₀ Z ₀ 2 ₀ T ₀ LM2575S - 3.3 P+
LM2575S -	<u>TO</u>	5	Full	N/A	N/A	Samples	1K+	\$1.4300	tube	[logo]U ₀ Z ₀ 2 ₀ T ₀

Fig. 5C



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LM2575S-ADJ	<u>TO</u> <u>263</u>	5	Full production	N/A	N/A	<div>Samples <div>Order Parts</div></div>	1K+	\$1.4300	tube of 45	[logo]U ₂ Z ₂ T LM2575S -ADJ P+
LM2575SX-12	<u>TO</u> <u>263</u>	5	Full production	N/A	N/A		1K+	\$1.4800	reel of 500	[logo]U ₂ Z ₂ T LM2575S -12 P+
LM2575SX-15	<u>TO</u> <u>263</u>	5	Full production	N/A	N/A		1K+	\$1.4800	reel of 500	[logo]U ₂ Z ₂ T LM2575S -15 P+
LM2575SX-3.3	<u>TO</u> <u>263</u>	5	Full production	N/A	N/A	<div>Order Parts</div>	1K+	\$1.4800	reel of 500	[logo]U ₂ Z ₂ T LM2575S -3.3 P+
LM2575SX-5.0	<u>TO</u> <u>263</u>	5	Full production	N/A	N/A	<div>Order Parts</div>	1K+	\$1.4800	reel of 500	[logo]U ₂ Z ₂ T LM2575S -5.0 P+
LM2575SX-ADJ	<u>TO</u> <u>263</u>	5	Full production	N/A	N/A	<div>Order Parts</div>	1K+	\$1.4800	reel of 500	[logo]U ₂ Z ₂ T LM2575S -ADJ P+
LM2575-ADJ MDC		die	Full production	N/A	N/A				N/A	

Design Tools



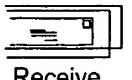


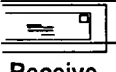
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SimpleSwitcher® DC-DC Converters Design Software	14 Kbytes	1-Nov - 2000		<u>View</u>	

Fig. 5F



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Application Notes

Title	Size (in Kbytes)	Date	 View Online	 Download	 Receive via Email
AN-1061: AN-1061 Power Conversion in Line-Powered Equipment	142 Kbytes	5-Jan - 97	View Online	Download	Receive via Email
AN-776: Application Note 776 20 Watt Simple Switcher Forward Converter	387 Kbytes	1-May - 98	View Online	Download	Receive via Email

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[Information as of 6-Nov-2000]

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[System Diagrams](#)

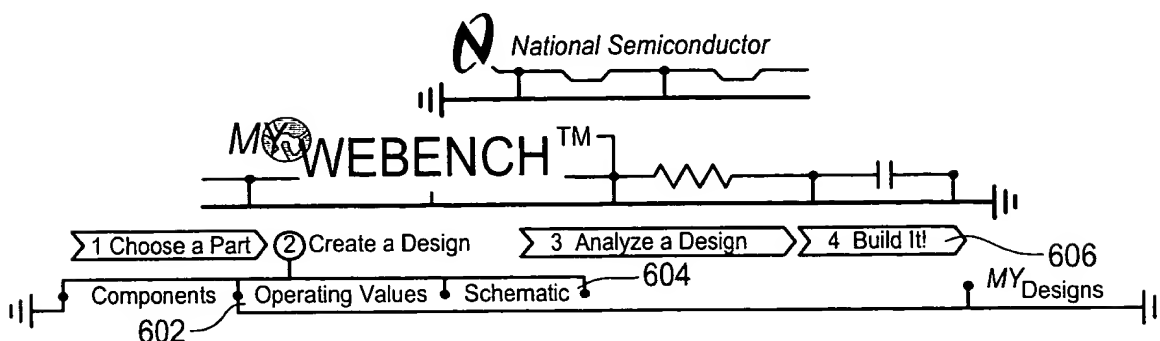
[Product Tree](#)

[Home](#)

Fig. 5G



12/19



Design: Design#6	Aug 30 2000 4:23PM	ID: 229899_6	Choose Operation
Device: LM2672			Delete , Copy
Design Requirements	Output #1		Rename , Add Notes
VinMin = 14.00 V	Vout= 3.30 V		Print , XML
VinMax = 22.00 V	Iout= 1.00 A		

Components				
Part	Manufacturer	Part#	Attributes	
Cb	AVX	08055C103KAT	0.010000 uF	Select Alternate Part
Cin	Nichicon	UPL1V121MPH	120.00 uF, 0.1400 Ohms	Select Alternate Part
Cout	Vishay - Sprague	594D127X06R3C2T	120.00 uF, 0.0850 Ohms	Select Alternate Part
Css	AVX	08055C103KAT	0.010000 uF	Select Alternate Part
D1	General Semiconductor	SS24	0.50 V	Select Alternate Part
IC	National Semiconductor	LM2672N-3.3	3.3, Buck	Select Alternate Part
L1	Coiltronics	UP2T -330	33.000 uH, 0.0790 Ohms	Select Alternate Part

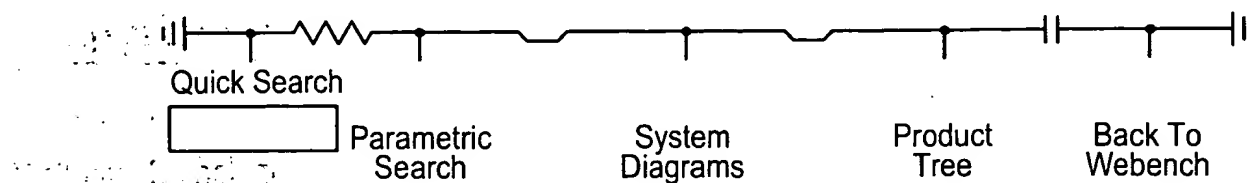
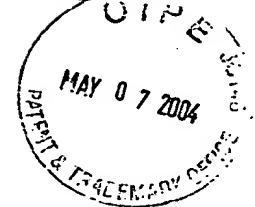


Fig. 6



Title: NETWORK-BASED INTEGRATED DEVICE IDENTIFICATION
AND ORDERING SYSTEM

Inventor(s): Wanda Carol Garrett, et al.

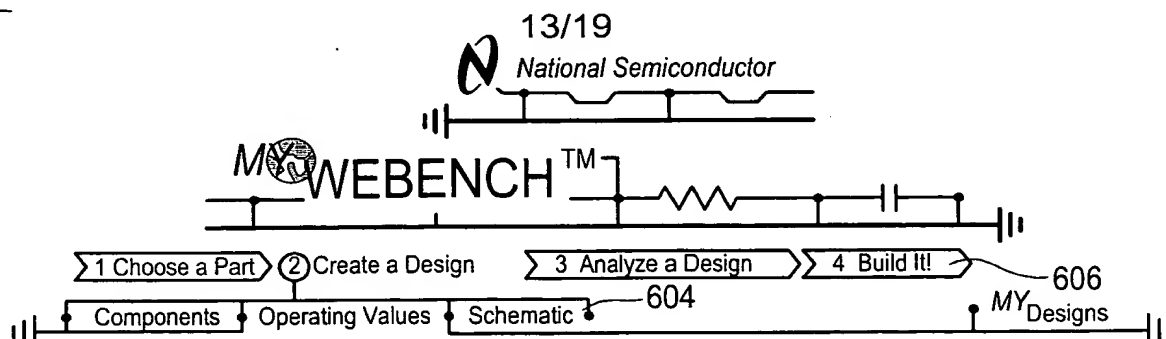
Serial No.: 09/707,325

Docket No. 12421-0030

REPLACEMENT SHEET

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Design: Design#6	Aug 30 2000 4:23PM	ID: 229899_6	Choose Operation
Device: LM2672			Delete , Copy
Design Requirements	Output #1		Rename , Add Notes
VinMin = 14.00 V	Vout= 3.30 V		Print , XML
VinMax = 22.00 V	Iout= 1.00 A		

Operating Values			
#	Description	Parameter	Value
1	Continuous or Discontinuous Conduction mode, inductor current goes to zero in Discontinuous Conduction	Mode	Cont
2	Total Output Power	Pout	3.30 W
3	Pulse Width Modulation (PWM) frequency	Frequency	260.00 kHz

Operating Point at Vin= 22.00 V			
#	Description	Parameter	Value
1	Bode Plot Phase Margin	Phase Marg	97.68 Deg
2	Bode Plot Crossover Frequency, indication of bandwidth of supply	Cross Freq	48.98 kHz
3	Peak -to -peak ripple voltage	Vout p-p	31.93 mV
4	IC Junction Temperature	IC Tj	95.40 °C
5	IC Junction to Ambient Thermal Resistance	ICThetaJA	100.21 °C/W
6	Steady State Efficiency	Efficiency	81.17 %
7	Steady State PWM Duty Cycle, range limits from 0 to 100	Duty Cycle	17.47 %

Current Analysis			
#	Description	Parameter	Value
1	Average input current	Iin Avg	0.45 A
2	Peak Current in IC for Steady State Operating Point	IC Ipk	1.19 A
3	Input Capacitor RMS ripple current	Cin IRMS	0.20 A
4	Inductor ripple current, peak-to-peak value	L Ipp	0.38 A
5	Output Capacitor RMS ripple current	Cout IRMS	92.07 mA
6	ICs Maximum rated peak current	IC Ipk Max	1.30 A

Fig. 7A

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Title: NETWORK-BASED INTEGRATED DEVICE IDENTIFICATION
AND ORDERING SYSTEM

Inventor(s): Wanda Carol Garrett, et al.

Serial No.: 09/707,325

Docket No. 12421-0030

REPLACEMENT SHEET

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Power Dissipation Analysis			
#	Description	Parameter	Value
1	Diode Power Dissipation	Diode Pd	0.41 W
2	Inductor Power Dissipation	L Pd	79.00 mW
3	IC Power Dissipation	IC Pd	0.25 W
4	Input Capacitor Power Dissipation	Cin Pd	20.47 mW

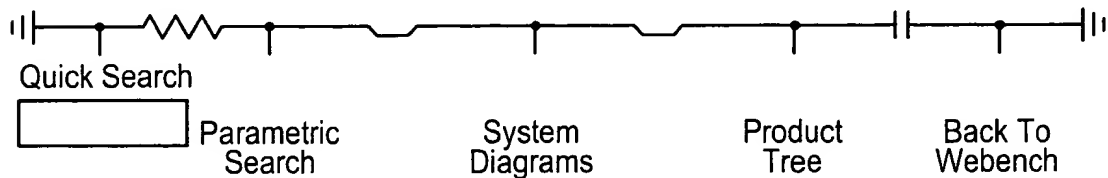


Fig. 7B



Title: NETWORK-BASED INTEGRATED DEVICE IDENTIFICATION AND ORDERING SYSTEM

Inventor(s): Wanda Carol Garrett, et al.

Serial No.: 09/707,325

Docket No. 12421-0030

REPLACEMENT SHEET

Sheet 15 of 19

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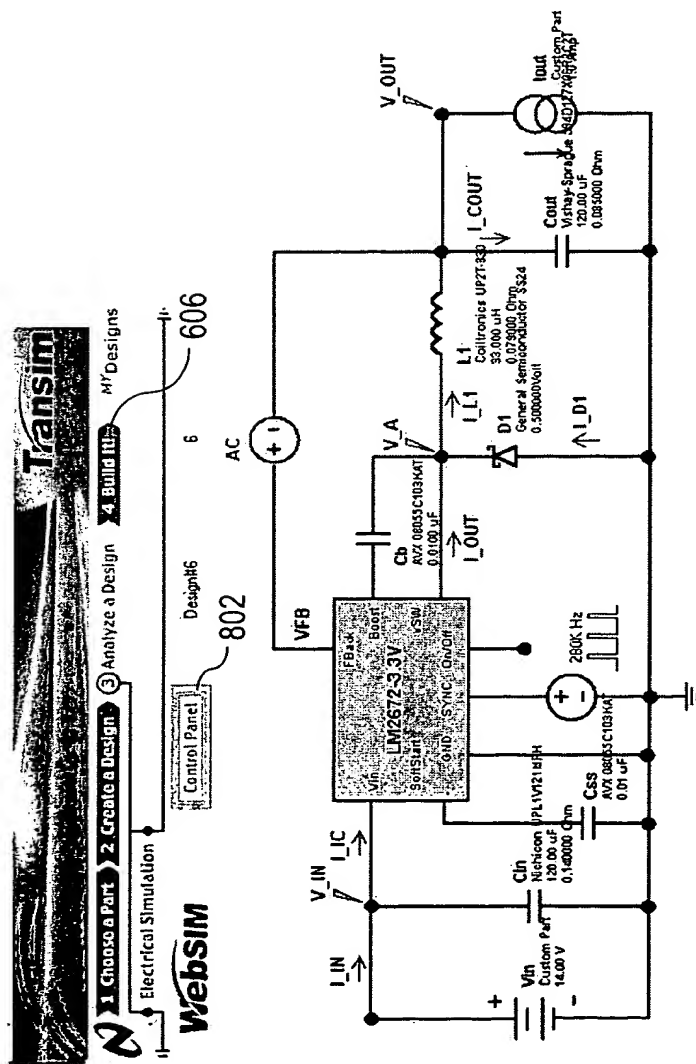


FIG. 8



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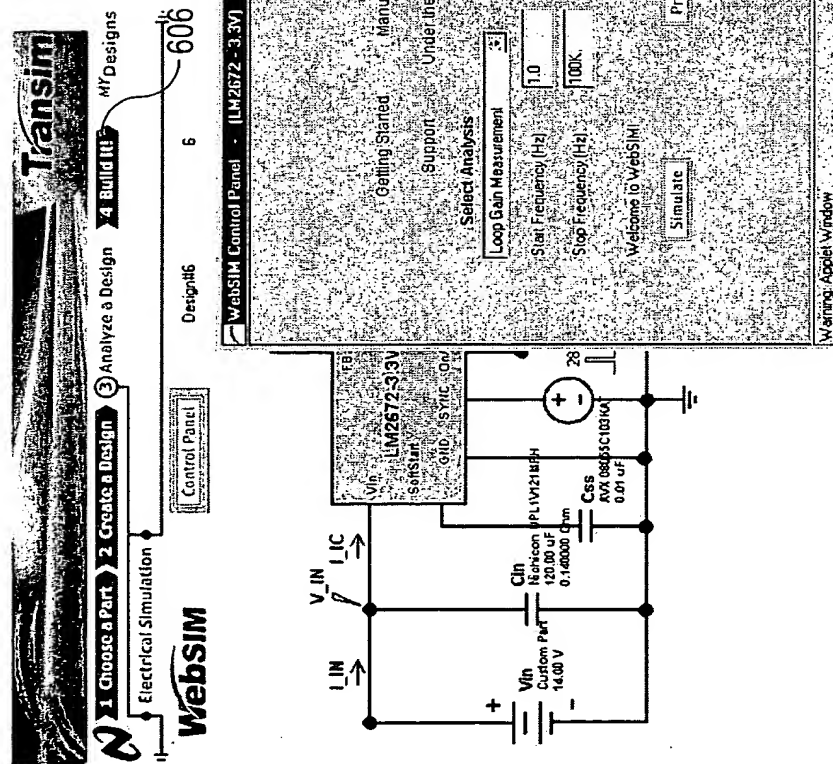
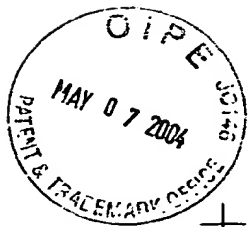
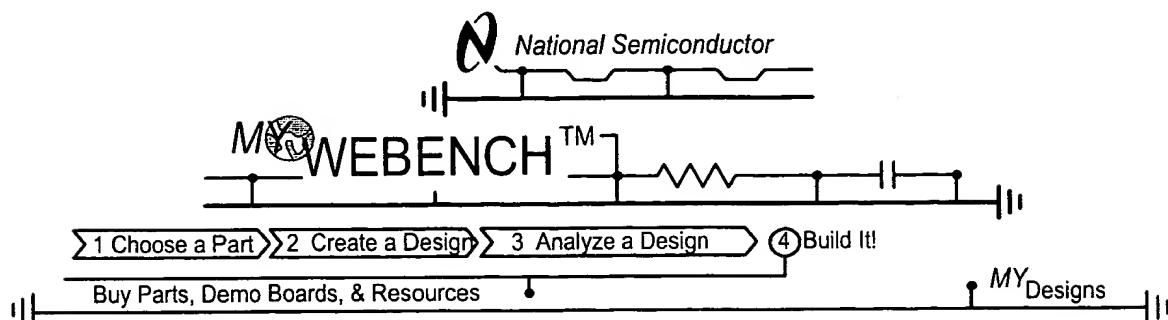


FIG. 9



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Design ID: 6

Bill of Materials						
Part	Manufacturer	Part#	Attributes	Price	Distributor	Order Parts
Cb	AVX	08055C103KAT	0.010000 uF	\$ 0.02	Future - Active	-
D1	General Semiconductor	SS24	0.50 V	\$ 0.20	Future - Active	-
IC	National Semiconductor	LM2672N-3.3	3.3,Buck,8- Lead DIP	\$ 2.9000 (For Qty=100)	1004	<input type="button" value="Order Parts"/>
L1	Coiltronics	UP2T-330	33.000 uH,0.0790 Ohms	Price Not Available		-
Cin	Nichicon	UPL1V121MPH	120.00 uF,0.1400 Ohms	\$.242	Avnet	-
Css	AVX	08055C103KAT	0.010000 uF	\$ 0.02	Future - Active	-
Cout	Vishay - Sprague	594D127X06R3C2T	120.00 uF,0.0850 Ohms	\$ 0.83	Future - Active	-
				Total Price: 4.212	<input type="button" value="ORDER KIT"/>	



Quick Search

Parametric
Search

Systems
Diagrams

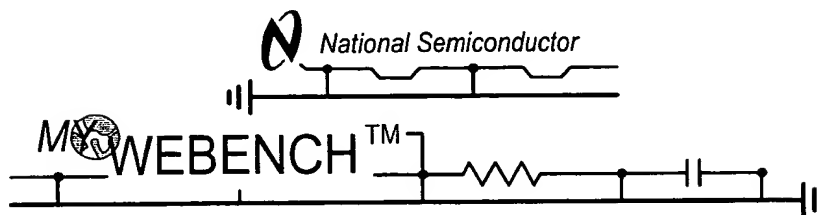
Product
Tree

Back To
Webench

Fig. 10



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Brian Hickman- You have 6 designs stored in your personal workspace.

ID	DesignName	Device	CreationDate	ModificationDate	Design Assistant	Comments	Design Operations
6	Design#6	LM2672	Aug 30 2000 4:23PM		power		Modify... Analyze... Build... Delete... Add... Notes...
5	Design#5	LM2670	Aug 30 2000 4:15PM		power		Modify... Analyze... Build... Delete... Add... Notes...
4	Design#4	LM2672	Aug 30 2000 4:02PM		power		Modify... Analyze... Build... Delete... Add... Notes...
3	Design#3	LM2575HV	Aug 30 2000 4:01PM		power		Modify... Analyze... Build... Delete... Add... Notes...
2	Design#2	LM2575	Aug 30 2000 3:30PM		power		Modify... Analyze... Build... Delete... Add... Notes...
1	Design#1		Aug 30 2000 3:29PM		power		Modify... Analyze... Build... Delete... Add... Notes...

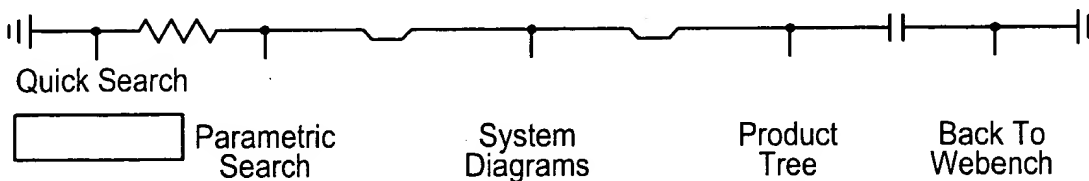
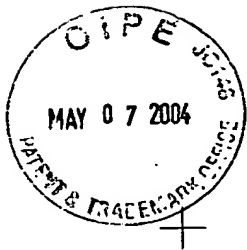


Fig. 11



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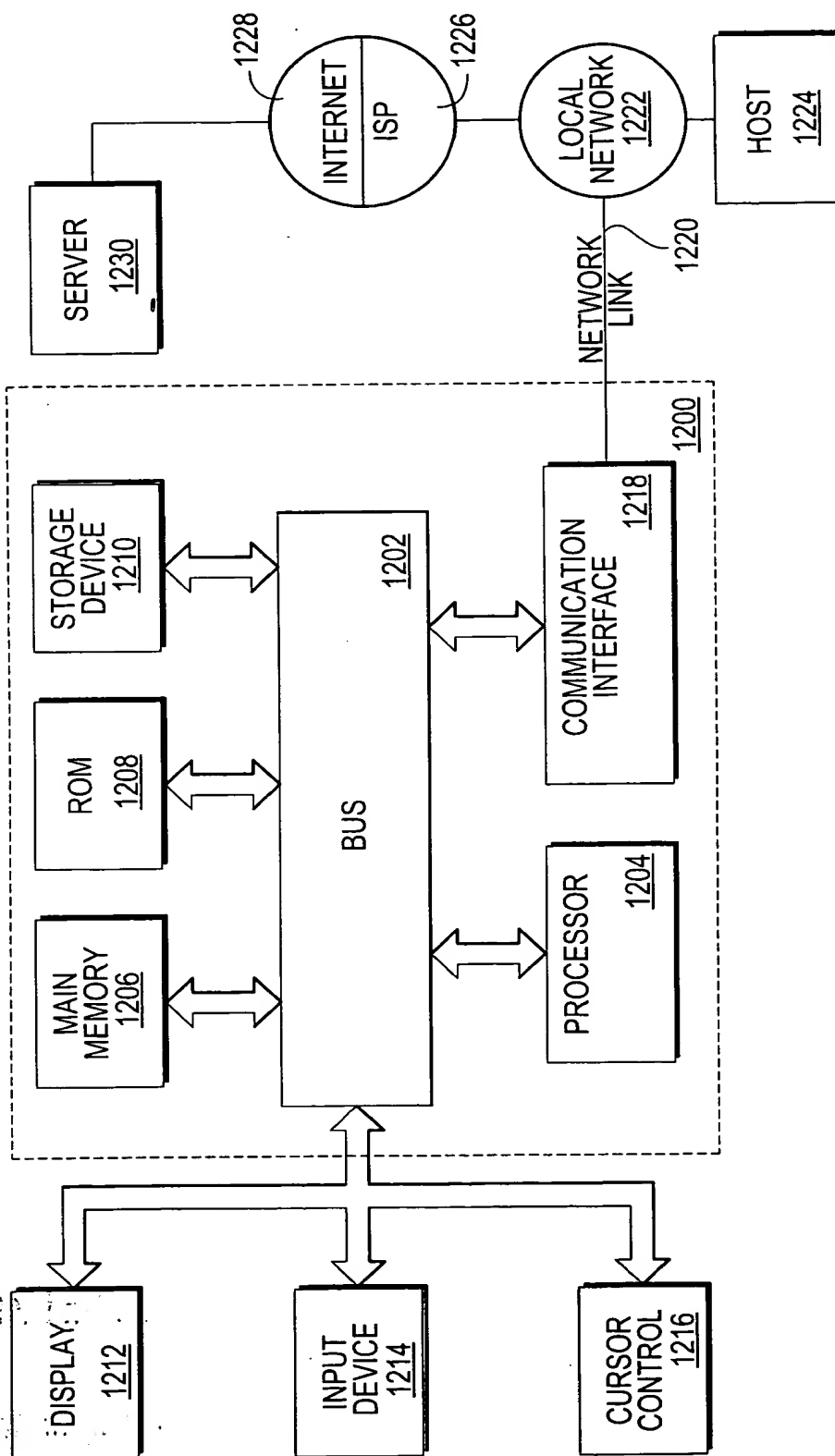


Fig. 12